## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| In re application: **Miller et al.** | § | Group Art Unit: **2154** |
| | § | |
| | § | Examiner: **Jeong S. Park** |
| Serial No.: **10/768,201** | § | |
| | § | Confirmation No.: **6041** |
| Filed: **January 30, 2004** | § | |
| | § | Attorney Docket No.: **RSW920030226US1** |
| For: **Method and Apparatus for Dynamically Selecting Functionally Equivalent Web services Through a Single Autonomic Proxy** | § | |
| | § | |

36736

PATENT TRADEMARK OFFICE
CUSTOMER NUMBER

**Commissioner for Patents**
**P.O. Box 1450**
**Alexandria, VA 22313-1450**

## APPEAL BRIEF (37 C.F.R. 41.37)

This brief is in furtherance of the Notice of Appeal, filed in this case on November 25, 2008.

## **REAL PARTY IN INTEREST**

The real party in interest in this appeal is the following party: International Business Machines Corporation of Armonk, New York.

# RELATED APPEALS AND INTERFERENCES

This appeal has no related proceedings or interferences.

## STATUS OF CLAIMS

### A. TOTAL NUMBER OF CLAIMS IN APPLICATION

The claims in the application are: 1-7, 9-19, 21-31 and 33-36

### B. STATUS OF ALL THE CLAIMS IN APPLICATION

Claims canceled: 8, 20 and 32

Claims withdrawn from consideration but not canceled: NONE

Claims pending: 1-7, 9-19, 21-31 and 33-36

Claims allowed: NONE

Claims rejected: 1-7, 9-19, 21-31 and 33-36

Claims objected to: NONE

### C. CLAIMS ON APPEAL

The claims on appeal are: 1-7, 9-19, 21-31 and 33-36

## STATUS OF AMENDMENTS

An amendment after Final Rejection was not filed. Therefore, Claims 1-7, 9-19, 21-31 and 33-36 on appeal herein are as amended in the Response to Office Action filed May 21, 2008.

# SUMMARY OF CLAIMED SUBJECT MATTER

## A. CLAIM 1 - INDEPENDENT

The subject matter of Claim 1 is directed to a method for dynamically selecting functionally equivalent Web services through a single autonomic proxy *(specification, p. 5, lines 3-12; Fig. 4A, items 402, 404 - 408 and 410).* The method includes the step of receiving a client request to locate a Web service at the single autonomic proxy *(specification, p. 15, lines 17-19; lines 14-19; p. 18, lines 2-5; Fig. 4A, items 402, 410; Fig. 4B, items 432, 434).* The method further includes the step of querying a policy discovery mechanism based on the client request *(specification, p. 15, lines 19 – p. 16, line 3; p. 17, lines 3-10; Fig. 4A, items 402, 412; Fig. 4B, items 434, 450).* The method further includes the step of using the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group *(specification, p. 18, lines 17-24; p. 19, lines 20-27; Fig. 5, items 504, 505; Fig. 6, item 602).* The method further includes the step of using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service *(specification, p. 5, lines 13-16; p. 20, line 19 – p. 21, line 9; Fig. 7, items 702-706, 708, 710).* The method further includes the step of sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available *(specification, p. 19, line 27 – 20, line 4; Fig. 6, item 604).* The method further includes, in response to a determination by the autonomic proxy that the first Web service is not available, the step of operating the dynamic proxy to discover the business policy of each of the other service candidate in the group of Web service candidates *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610).* The method further includes, in response to a determination that the first Web service is not available, the step of operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610).* The method further includes the step of sending a request to the second Web service to serve the client request *(specification, p. 20, lines 11-18; Fig. 6, lines 612, 614).*

## B. CLAIM 13- INDEPENDENT

The subject matter of Claim 13 is directed to a data processing system for dynamically selecting functionally equivalent Web services through a single autonomic proxy *(specification, p. 5, lines 3-12; Fig. 4A, items 402, 404 - 408 and 410)*. The system includes receiving means for receiving a client request to locate a Web service at the autonomic proxy *(specification, p. 15, lines 17-19; lines 14-19; p. 18, lines 2-5; Fig. 4A, items 402, 410; Fig. 4B, items 432, 434)*. The system further includes querying means for querying a policy discovery mechanism based on the client request *(specification, p. 15, lines 19 – p. 16, line 3; p. 17, lines 3-10; Fig. 4A, items 402, 412; Fig. 4B, items 434, 450)*. The system further includes locating means for operating the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group *(specification, p. 18, lines 17-24; p. 19, lines 20-27; Fig. 5, items 504, 505; Fig. 6, item 602)*. The system further includes first selecting means for using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service *(specification, p. 5, lines 13-16; p. 20, line 19 – p. 21, line 9; Fig. 7, items 702-706, 708, 710)*. The system further includes first sending means for sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available *(specification, p. 19, line 27 – 20, line 4; Fig. 6, item 604)*. The system further includes discovering means responsive to a determination by the autonomic proxy that the first Web service is not available, for operating the dynamic proxy to discover the business policy of each of the other service candidates in the group of Web service candidates *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610)*. The system further includes second selecting means, responsive to a determination that the first Web service is not available for operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610)*. The system further includes sending means for sending a request to the second Web service to serve the client request *(specification, p. 20, lines 11-18; Fig. 6, lines 612, 614)*.

## C. CLAIM 25 - INDEPENDENT

The subject matter of Claim 25 is directed to a computer program product in an executable computer readable medium for dynamically selecting functionally equivalent Web services through a single autonomic proxy *(specification, p. 5, lines 3-12; Fig. 4A, items 402, 404 - 408 and 410).* The product includes first instructions for receiving a client request to locate a Web service at the autonomic proxy *(specification, p. 15, lines 17-19; lines 14-19; p. 18, lines 2-5; Fig. 4A, items 402, 410; Fig. 4B, items 432, 434).* The product further includes second instructions for querying a policy discovery mechanism based on the client request *(specification, p. 15, lines 19 – p. 16, line 3; p. 17, lines 3-10; Fig. 4A, items 402, 412; Fig. 4B, items 434, 450).* The product further includes third instructions for operating the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group *(specification, p. 18, lines 17-24; p. 19, lines 20-27; Fig. 5, items 504, 505; Fig. 6, item 602).* The product further includes fourth instructions for using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service *(specification, p. 5, lines 13-16; p. 20, line 19 – p. 21, line 9; Fig. 7, items 702-706, 708, 710).* The product further includes fifth instructions for sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available *(specification, p. 19, line 27 – 20, line 4; Fig. 6, item 604).* The product further includes sixth instructions for operating the dynamic proxy to discover the business policy of each of the other service candidates in the group of Web service candidates, in response to a determination by the autonomic proxy that the first Web service is not available *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610).* The product further includes seventh instructions for operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy, in response to a determination that the first Web service is not available *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610).* The product further includes eighth instructions for sending a request to the second Web service to serve the client request *(specification, p. 20, lines 11-18; Fig. 6, lines 612, 614).*

## D. CLAIM 2 – DEPENDENT

The subject matter of Claim 2 is directed to the method of Claim 1, as modified by the limitations of Claim 1. Thus, Claim 2 is directed to a method for dynamically selecting functionally equivalent Web services through a single autonomic proxy *(specification, p. 5, lines 3-12; Fig. 4A, items 402, 404 - 408 and 410).* The method includes the step of receiving a client request to locate a Web service at the single autonomic proxy *(specification, p. 15, lines 17-19; lines 14-19; p. 18, lines 2-5; Fig. 4A, items 402, 410; Fig. 4B, items 432, 434).* The method further includes the step of querying a policy discovery mechanism based on the client request *(specification, p. 15, lines 19 – p. 16, line 3; p. 17, lines 3-10; Fig. 4A, items 402, 412; Fig. 4B, items 434, 450).* The method further includes the step of using the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group *(specification, p. 18, lines 17-24; p. 19, lines 20-27; Fig. 5, items 504, 505; Fig. 6, item 602).* The method further includes the step of using the single autonomic proxy to select a first Web service, to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service, and the autonomic proxy is disposed to measure the response times of each Web service by sending messages to each of the Web service candidates. *(specification, p. 5, lines 13-16; p. 20, line 19 – p. 21, line 9; Fig. 7, items 702-706, 708, 710).* The method further includes the step of sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available *(specification, p. 19, line 27 – 20, line 4; Fig. 6, item 604).* The method further includes, in response to a determination by the autonomic proxy that the first Web service is not available, the step of operating the dynamic proxy to discover the business policy of each of the other service candidate in the group of Web service candidates *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610).* The method further includes, in response to a determination that the first Web service is not available, the step of operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610).* The method further includes the step of sending a request to the second Web service to serve the client request *(specification, p. 20, lines 11-18; Fig. 6, lines 612, 614).*

## E. CLAIM 3 – DEPENDENT

The subject matter of Claim 3 is directed to the method of Claim 2, as modified by the limitations of Claim 2. Thus, Claim 3 is directed to a method for dynamically selecting functionally equivalent Web services through a single autonomic proxy *(specification, p. 5, lines 3-12; Fig. 4A, items 402, 404 - 408 and 410).* The method includes the step of receiving a client request to locate a Web service at the single autonomic proxy *(specification, p. 15, lines 17-19; lines 14-19; p. 18, lines 2-5; Fig. 4A, items 402, 410; Fig. 4B, items 432, 434).* The method further includes the step of querying a policy discovery mechanism based on the client request *(specification, p. 15, lines 19 – p. 16, line 3; p. 17, lines 3-10; Fig. 4A, items 402, 412; Fig. 4B, items 434, 450).* The method further includes the step of using the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group *(specification, p. 18, lines 17-24; p. 19, lines 20-27; Fig. 5, items 504, 505; Fig. 6, item 602).* The method further includes the step of using the single autonomic proxy to select a first Web service, to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service, the autonomic proxy is disposed to measure the response times of each Web service by sending messages to each of the Web service candidates, and the autonomic proxy dynamically selects the Web service that is responding most quickly according to its business policy to be the first Web service *(specification, p. 5, lines 13-16; p. 20, line 19 – p. 21, line 9; Fig. 7, items 702-706, 708, 710).* The method further includes the step of sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available *(specification, p. 19, line 27 – 20, line 4; Fig. 6, item 604).* The method further includes, in response to a determination by the autonomic proxy that the first Web service is not available, the step of operating the dynamic proxy to discover the business policy of each of the other service candidate in the group of Web service candidates *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610).* The method further includes, in response to a determination that the first Web service is not available, the step of operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy *(specification, p. 20, lines 5-11; Fig. 6, items 604, 610).* The method further includes the step of sending a request to the second Web service to serve the client request *(specification, p. 20, lines 11-18; Fig. 6, lines 612, 614).*

# GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

## A. GROUND OF REJECTION 1 (Claims 1, 4-7, 9-19, 21-31 and 33-36)

Claims 1, 4-7, 9-19, 21-31 and 33-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. Appl. Pub. No. 2004/0064428 to *Larkin* et al. (hereinafter "*Larkin*") in view of U.S. Pat. Appl. Pub. No. 2004/0122926 to *Moore* et al. (hereinafter "*Moore*").

## B. GROUND OF REJECTION 2 (Claims 2 and 3)

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. Appl. Pub. No. 2004/0064428 to *Larkin* et al. (hereinafter "*Larkin*") in view of U.S. Pat. Appl. Pub. No. 2004/0122926 to *Moore* et al. (hereinafter "*Moore*") and further in view of U.S. Pat. Appl. Pub. No. 2004/0220910 to *Zang* et al. (hereinafter "*Zang*").

## C. GROUND OF REJECTION 3 (Claims 25-31 and 33-34)

Claims 25-31 and 33-34 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

# ARGUMENT

## A. GROUND OF REJECTION 1 (Claims 1, 4-7, 9-19, 21-31 and 33-36)

Claims 1, 4-7, 9-19, 21-31 and 33-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. Appl. Pub. No. 2004/0064428 to *Larkin* et al. (hereinafter "*Larkin*") in view of U.S. Pat. Appl. Pub. No. 2004/0122926 to *Moore* et al. (hereinafter "*Moore*").

Independent Claim 1 reads as follows:

> 1. A method for dynamically selecting functionally equivalent Web services through a single autonomic proxy, comprising:
>
> receiving a client request to locate a Web service at the single autonomic proxy;
>
> querying a policy discovery mechanism based on the client request;
>
> using the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group;
>
> using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service;
>
> sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available;
>
> in response to a determination by the autonomic proxy that the first Web service is not available, operating the dynamic proxy to discover the business policy of each of the other service candidate in the group of Web service candidates;
>
> in response to a determination that the first Web service is not available, operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy; and
>
> sending a request to the second Web service to serve the client request.

### A.1. Teachings of Appellants

In making their invention, the Appellants sought to enable dynamic selection of Web services, through the use of a mechanism comprising a single autonomic proxy. In embodiments of the invention, selection of a Web service may be based on non-technical attributes of a service, such as business criteria, as well as technical characteristics of the service. In one embodiment, after multiple Web service candidates are located, a single autonomic proxy selects one of the services to invoke, and sends a message to the selected service, to determine whether it is available. If the selected service is not available, the autonomic proxy discovers the business policy of each of the remaining Web service candidates, and selects one of them. The autonomic proxy may also measure the response times of each Web service, by sending messages to each of the Web service candidates. The autonomic proxy then dynamically selects the Web service that is responding the quickest, according to its policy.

These teachings are disclosed in Appellants' specification, such as at page 5, lines 3-12; page 19, line 25 – page 20, line 12; page 20, line 23 – page 21, line 5; and Figures 4B and 6. Figure 4B depicts an application server that includes an autonomic proxy 430, in accordance with an embodiment of the invention, for selecting functionally equivalent servers. The above teachings are as follows.

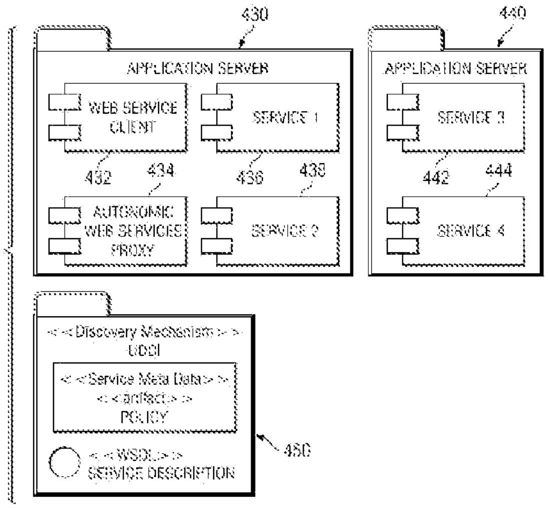


*FIG. 4B*

> The present invention provides a method and system for dynamically selecting functionally equivalent web services through a single autonomic proxy. The present invention addresses quality of service issues common in the Web service environment, such as failover, redundancy, performance, and security. The present invention may also apply policies based upon non-technical attributes of a service, e.g. business criteria. Such business criteria may be a preferred vendor or business partner or the cost of the service. **[page 5, lines 3-12]**
>
> When the autonomic proxy locates one or more Web services that have registered an implementation of the wsdlSpec tModel (step **602**), before utilizing this selected Web service to service the client request, autonomic proxy sends a message to the Web service to determine if the selected Web service is available (i.e., the network link to the selected candidate is available) (step **604**). If the selected Web service is available, the selected Web service may service the client request (step **606**), the process terminating thereafter. Turning back to step **604**, if the autonomic proxy determines that the selected Web service is no longer available, the autonomic proxy may discover the policy of each Web service candidate in the group of Web service candidates (step **608**), and select another Web service from the pool of appropriate candidates based on the policy (step **610**). The autonomic proxy sends the client request to the newly selected Web service (step **612**). **[page 19, line 25 – page 20, line 12]**

> When the autonomic proxy locates one or more Web services that have registered an implementation of the wsdlSpec tModel (step **702**), before utilizing this selected Web service to service the client request, autonomic proxy may measure the response times of each Web service by sending messages to each of the Web service candidates (step **704**). The autonomic proxy may analyze the responses received and discover the policy of each Web service candidate in the group of Web service candidates (step **706**). The autonomic proxy may then dynamically select the Web service that is responding the quickest according to the policy (step **708**). **[page 20, line 23 – page 21, line 5]**

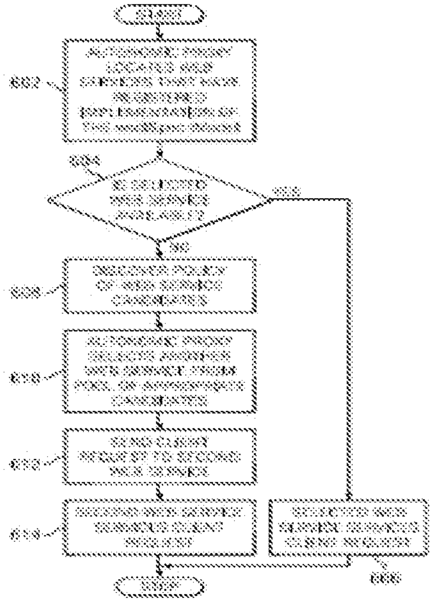


*FIG. 8*

### A.2. <u>Rejection of Claim 1</u>

In rejecting Claim 1 under 35 U.S.C. § 103 in the Final Office Action, the Examiner cited *Larkin* at paragraphs [0028], [0029], [0031] and [0032] thereof, and Figures 1 and 2 of the drawings. The Examiner cited *Moore* at paragraphs [0008], [0009], [0034], [0042], [0043] and [0053] thereof, and Figures 2, 3 and 4 of the drawings.

The Examiner bears the burden of establishing a prima facie case of obviousness based on prior art when rejecting claims under 35 U.S.C. § 103. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992).

In order to establish *a prima facie* case of obviousness under 35 U.S.C. § 103, *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966) requires determining, respectively, the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the pertinent art. Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning, to support the legal conclusion of obviousness. *KSR Int'l. Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007) (citing I*n re Kahn*, 441 F.3d 977, 988 (Canada Fed. 2006)). Additionally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981. 180 USPQ 580 (CCPA 1974). The suggestion to make the claim combination must be found in the prior art, not in the Applicants' disclosure. *In re Vaek*, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Moreover, in accordance with **MPEP § 2142.02**, each prior art reference must be considered in its <u>entirety</u>, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.,* 220 U.S.P.Q. 303 (Fed. Cir. 1993). A third essential requirement for establishing a prima face case, set forth in **MPEP § 2143.01**, is that the proposed modification cannot render the prior art unsatisfactory for its intended purpose. **MPEP § 2143.03** requires that <u>all words</u> in a claim must be considered in judging the patentability of the claim.

In the present case, not all of the features of the claimed invention have been properly considered, and the teachings of the references do not teach or suggest the claimed subject matter to a person of ordinary skill in the art. For example, no combination of *Larkin* and *Moore* teaches or suggests, in the over-all combination of Claim 1, either of the following features:

> (1) Using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service (hereinafter "Feature (1)").
>
> (2) Sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available, and in response to a determination that the first Web service is not available, operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy (hereinafter "Feature (2)").

### A.3. Feature (1) of Claim 1 Distinguishes Over Larkin Reference

Pertinent teachings of *Larkin* are found such as at paragraphs [0014], [0028]-[0029] and [0031]-[0032]. These sections are as follows:

> **[0014]** The system for collecting and accessing data related to Web services receives service requests from a service requester. In one embodiment, the service requests comprise a collection of name and value pairs that specify desired values for likely parameters. In response to service requests, the present invention performs tasks such as queries to service registries, consultations with service definitions, invocation of services, and aggregation of data from the invoked services. The tasks are performed without requiring direct knowledge by the service requester of the service directories, available Web services, and their required parameters and formats. After completion of the necessary tasks, the system provides service information and/or service results to the service requester.
>
> **[0028]** Referring to **FIG. 1, a** Web services data aggregation and review system **100** includes an aggregation and review engine **110,** and an aggregated data store **120.** In addition to the data store **120,** the aggregation and review engine **110** is preferably interconnected with, or has access to, one or more service registries **130** and one or more service definitions **140.** The Web services data aggregation and review system **100** addresses many of the problems and issues inherent in the prior art discovery and integration techniques as discussed in the Background Section above.
>
> **[0029]** In operation, the aggregation and review engine **110** receives service requests **108** from a service requester **150.** The service requests **108** result in tasks being performed by the engine **110** such as queries to the service registries **130,** consultations with the service definitions **140,** invocation of services from one or more service providers **160,** and information storage to and retrieval from the aggregated data store **120.** The performed tasks typically result in the engine **110** providing service information **112** and/or service results **114** to the service requester **150.**
>
> **[0031]** The service registries **130** contain service descriptions that describe the functionality of available Web services along with general information such as web service names, locations, and service types. Additionally, the service registries **130** typically function as a directory listing service and provide convenient access points for locating services distributed throughout an intra-network or inter-network. In one embodiment, the service registries **130** are accessible through various keys such as entity name for white pages access and entity type for yellow pages access.

> **[0032]** In the depicted embodiment, the service registries **130** receive directory queries **128** and provide directory results **132.** The directory queries **128** and the directory results **132** conform to the directory services specification. In the embodiment of **FIG. 1,** the directory queries **128** and the directory results **132** conform to the UDDI specification. Namely, in this embodiment a directory query **128** includes invocation of the UDDI find-business method and the directory results **132** includes a UDDI businessList structure.

As disclosed by these and other teachings of *Larkin*, embodiments thereof are directed to a system for collecting and accessing data related to Web services, which receives service requests from a service requester. In response to a service request, tasks can be performed such as queries to service registries, invocation of services, and aggregation of data from the invoked services. The tasks are performed without requiring direct knowledge by the service requester of the service directories, available Web services, and their required parameters and formats.

At page 4 of the Final Office Action, the Examiner acknowledged that *Larkin* fails to disclose Feature (1) of Applicants' Claim 1 in its entirety. In particular, the Examiner acknowledged that *Larkin* does not teach the Feature (1) recitation of using a single autonomic proxy to select a first Web service, to invoke from a group of Web service candidates, wherein the selection is based on the business policy of the first Web service. Accordingly, the Examiner cited *Moore* in regard to this feature.

### A.4. Feature (1) of Claim 1 Distinguishes Over Cited References

Pertinent teachings of *Moore* are found such as at paragraphs [0034], [0036], [0039], [0053] and Fig. 4. These sections of *Moore* are as follows:

> **[0034] As** generally represented in **FIG. 3,** one aspect of the present invention is directed towards selection of a resource (from among a plurality of available resources that otherwise match a client's needs) based on the resource's reputation. To this end, a selection mechanism **302** selects a resource from a list **304** (or other suitably arranged data) and narrows the list to a selected resource **306** based on reputation data **308.** The list may be maintained by a listing mechanism **310** that is internal or external to a computer requesting selection, and the reputation data provided by an internal or external auditor **312.** Note that some or all of the components of **FIG. 3,** including the selection mechanism **302,** may execute in the computer system **202** of **FIG. 2,** may execute external to it, or be distributed among internal and external components, and the selected resource **306** may

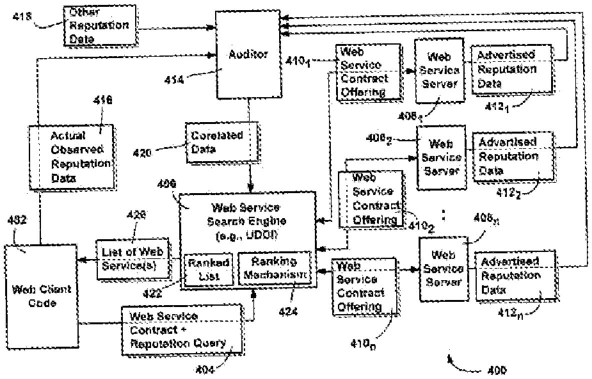
be one of the resources shown in **FIG. 2,** e.g., the disk driver/disk **210, 212,** the external hardware or software resource **206,** the application **200,** or some other resource. For example, as described below, part of a set of web services may be narrowed into a subset of web services by a selection mechanism component in a search engine, and that subset narrowed to one web service by a selection mechanism in a client. **(emphasis added)**

**[0036]** In accordance with an aspect of the present invention and described below, from the set determined by matching the client's contract requirements with a web service's contract offerings, the client ultimately chooses one web service to use based on reputation data. In other words, highly-detailed contract matches on specific web service interface definitions allow for global searches of web service providers. When, as is typical, the search results comprise more than one such resource that matches the specified contract requirements, the client needs to select one from the search results. The present invention provides a system and method for selecting a resource by filtering and/or ranking the search results via reputation data. **(emphasis added)**

**[0039]** With this data, the present invention provides a system and method for automating the selection of a web service based on reputation information. More particularly, as described below, in one implementation a requesting web service consumer may use reputation scores to filter and/or rank a list of search results that is initially obtained by matching the consumer's contract requirements. When ranking, the various scores for each behavioral attribute category may be given different weights. For example, if a particular requesting consumer cares most about cost, that consumer may give the cost category more weight than other categories, and thereby have the search results ranked differently from another consumer that is more concerned with low latency. Note that as described below, the filtering and/or ranking need not be actually performed by the client, but instead may be performed by a server on behalf of the client. **(emphasis added)**

**[0053]** Once the web services search engine 406 has built the ranked list 422, the web services search engine 406 may perform a number of tasks to further process the list, such as to communicate with the top-ranked web service servers to establish that they are still available to provide the requested service, and/or to communicate with the auditor to confirm that the reputation data for each top-ranked web service server is still correct. For example, a web-service may fluctuate in its reputation based on its server's current load, that is, if not too busy, the service is highly rated, but if busy, the service is poorly rated. Since loads can quickly vary, the auditor can be contacted in near real time to obtain more up-to-date the reputation data for top-ranked candidates, and

> if necessary, readjust some or all of the top-ranked web services on the list, to add, remove, re-order and so forth.



418
Other Reputation Data
Auditor
414
410$_1$
Web Service Contract Offering
Web Service Server
Advertised Reputation Data
408$_1$
412$_1$
416
Actual Observed Reputation Data
420
Corelated Data
408$_2$
Web Service Server
Advertised Reputation Data
412$_2$
406
Web Service Contract Offering
410$_2$
408$_n$
Web Service Search Engine (e.g., UDDI)
402
426
List of Web Service(s)
Ranked List
Ranking Mechanism
Web Service Contract Offering
Web Service Server
Advertised Reputation Data
Web Client Code
422
424
412$_n$
Web Service Contract + Reputation Query
410$_n$
404
400

FIG. 4

As discussed above, the entire teachings of a prior art reference must be considered, in order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103. At paragraph [0034], *Moore* clearly teaches the use of two different selection mechanisms, in order to select a Web service for a client. More specifically, *Moore* teaches that a set of Web services is narrowed into a subset of Web services, by a selection mechanism component in a search engine. Then, a second selection mechanism, located in the client, is used to narrow the subset down to one Web service for the client. In the Final Office Action at page 3, the Examiner states that the engine 110 of *Larkin* is equivalent to the autonomic proxy of Appellants' Claim 1. *Moore*, however, clearly teaches that the final selection of a service is made by the client, and not by the search engine.

The *Moore* teaching of ultimate selection by the client is also emphasized at paragraph [0036] thereof. Therein, it is stated that "the client ultimately chooses one Web service to use." This teaching, and the need for two mechanisms to select a service, is further emphasized at Figure 4 of *Moore*. As taught at Figure 4 and paragraph [0055], a Web service search engine 406 provides a list of Web services 426, and a final selection of the list is made by client 402 of Figure 4.

*Moore* further teaches that the process thereof for selecting a Web service is to be based on reputation data of prospective services. This requirement of *Moore* is stated explicitly, such as at paragraphs [0036] and [0039]. Moreover, by repeatedly stressing the teachings discussed above, the *Moore* arrangement sets forth an essential principle thereof. That is, *Moore* teaches that if a Web service is to be selected based on reputation of Web services, then it is desirable or preferred to use two selection mechanisms, a search engine to make an initial selection, and a client mechanism to make the final selection.

It is readily apparent that *Moore*, in view of the above principle emphasized thereby, teaches away from use of a single autonomic proxy, to select a Web service from a group of Web service candidates, as required by Feature (1) of Claim 1. The recitation of Feature (1) is thus clearly incompatible with the explicit teachings of *Moore*, such as at paragraph [0034] thereof, which contrarily require use of two selection mechanisms, in order to achieve the intended results of *Moore*.

Teachings of *Larkin*, either alone or in any combination with *Moore*, do not overcome the above deficiencies of *Moore* in regard to Feature (1).

Feature (1) of Claim 1 additionally distinguishes over *Moore* in reciting the selection of a first Web service based on the business policy of the first Web service. In contrast, *Moore* stresses that a Web service is to be selected based on its reputation. It is considered that a business policy is inherently different from a reputation, and is therefore not equivalent thereto.

### A.5. **Feature (2) of Claim 1 Distinguishes Over Cited References**

Claim 1 is considered to distinguish further over the cited references in reciting Feature (2) thereof, that is, sending a message to the Web service from the autonomic proxy to determine if the first Web service is available, and if not, operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates, based on the business policy. This feature is taught by Appellants' specification, such as at page 19, line 25-page 20, line 11. However, such feature is not disclosed by *Larkin*, as indicated by the Final Office Action. For example, at page 5 of the Final Office Action, in regard to the Claim 1 recitation of determining if a first Web service is still available, no citation is made to *Larkin* as showing this feature. The only citation is to *Moore*, at page 7, paragraph [0053] thereof.

In regard to *Moore*, paragraph [0053] thereof discloses performing tasks which include establishing that top-ranked web service servers are still available to provide a requested service. However, this paragraph is very unclear, at best, in regard to what is to be done if a server or service is not available. In any event, such paragraph does not teach operating an autonomic proxy to dynamically select a second web service from a group of candidates, based on the business policy. Thus, *Moore* does not disclose Feature (2) of Claim 1. As discussed above, the reputation data of *Moore,* used therein for service selections, is not considered equivalent to the business policy recited by Appellants' Claim 1.

## A.6. References Cannot be Combined

The Final Office Action additionally fails to state a *prima facie* obviousness rejection against Claim 1, because the Final Office Action does not state a proper reason to combine the *Larkin* and *Moore* references. As discussed above, *KSR Int'l Co. v. Teleflex, Inc.*, supra, requires that there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. In this case, the Final Office Action has provided no such articulated reasoning. Instead, the Final Office Action has asserted only a purported advantage to combining the references, which is not taught by the references. However, the Final Office Action has not provided any reasoning to show how the prior purported advantage supports the legal conclusion of obviousness, under the standards of *KSR, Int'l.*

Moreover, in the Final Office Action *Moore* was combined with *Larkin* expressly to show selection of a web service, wherein selection was based on reputation information of the service. As discussed above, an essential teaching of *Moore* is that when a service is to be selected based on reputation, it is preferable or advantageous to use an arrangement with two selection mechanisms, including a search engine mechanism and a client mechanism. However, the two selection mechanisms taught by *Moore* is clearly in direct conflict with the single selection mechanism required by Appellants' Claim 1. Accordingly, essential features of *Moore* teach those of skill in the art away from combining *Moore* with *Larkin* under 35 U.S.C. § 103, in order to realize Appellants' Claim 1 in its entirety.

The *Zang* reference, either alone or in any combination with *Larkin* or *Moore*, fails to overcome the deficiencies of *Larkin* and *Moore* discussed above in regard to Claim 1.

## A.7. Claims 4-7, 9-19, 21-31 and 33-36

Independent Claims 13 and 25 respectively incorporate subject matter similar to the patentable subject matter of Claim 1, and are each considered to distinguish over the cited references, in any combination, for at least the same reasons given in support thereof.

Claims 4-7 and 9-12 respectively depend from Claim 1, and are considered to distinguish over the cited references, in any combination, for at least the same reasons given in support thereof.

Claims 14-19 and 21-24 respectively depend from Claim 13, and are each considered to patentably distinguish over the cited references, in any combination, for at least the same reasons given in support thereof.

Claims 26-31 and 33-36 respectively depend from Claim 25, and are each considered to patentably distinguish over the cited references, in any combination, for at least the same reasons given in support thereof.

## B. GROUND OF REJECTION 2 (Claims 2 and 3)

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. Appl. Pub. No. 2004/0064428 to *Larkin* et al. (hereinafter "*Larkin*") in view of U.S. Pat. Appl. Pub. No. 2004/0122926 to *Moore* et al. (hereinafter "*Moore*") and further in view of U.S. Pat. Appl. Pub. No. 2004/0220910 to *Zang* et al. (hereinafter "*Zang*").

### B.1. Claim 2 Further Distinguishes Over Cited References

Claims 2 and 3 respectively depend from Claim 1, and are each considered to distinguish over the cited references, in any combination, for at least the same reasons given in support thereof.

Claim 2 is additionally considered to distinguish over the art in reciting that the autonomic proxy is disposed to measure response times at each Web service, by sending messages to each of the Web service candidates. None of the cited references, or any combination thereof, discloses this feature. For example, the *Zang* reference, such as at paragraph [0170], discloses that response time is measured by a Response Time Agent 522, and not by an autonomic proxy as recited by Claim 2.

### B.2. Claim 3 Further Distinguishes Over Cited References

Claim 3 is additionally considered to distinguish over the art in reciting that the autonomic proxy dynamically selects the Web service that is responding most quickly, according to its business policy, to be the first Web service. None of the cited references, or any combination thereof, discloses this feature. For example, *Zang* fails to disclose the use of business policy to select the Web service that is responding most quickly.

## C. GROUND OF REJECTION 3 (Claims 25-31 and 33-34)

Claims 25-31 and 33-34 stand rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Independent Claim 25 recites a computer readable medium. In the Final Office Action, it is stated that the specification provides no explicit and deliberate definition of the computer readable medium.

In response, Appellants note that their specification, such as at page 6, lines 16-18 and Figure 3, discloses a data processing system in which their invention may be implemented. Figure 3 includes a hard disk drive 326, a CD-ROM 330, a main memory 304, additional memory 324 and a tape 328. Each of these components is considered to be a type of computer readable medium that is very well known to those of skill in the art. Moreover, the specification at page 22, lines 17-19 states explicitly that computer readable media includes such things as a floppy disk, a hard disk drive, a RAM, CD-ROMs and DVD-ROMs.

Accordingly, the specification provides clear support for the computer readable medium recited by Claim 25. The rejection of Claim 25 under 35 U.S.C. § 101, as well as of Claims 26-31 and 33-34 that respectively depend from Claim 25, is thereby overcome.

## CONCLUSION

Claims 1-7, 9-19, 21-31 and 33-36 are respectively believed to patentably distinguish over the *Larkin*, *Moore*, and *Zang* references in any combination, and are each directed to statutory subject matter, for at least all of the above reasons. Therefore, it is respectfully requested that the Board reverse the Examiner's final rejection of those claims.

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# CLAIMS APPENDIX

The text of the claims involved in the appeal is as follows:

1. A method for dynamically selecting functionally equivalent Web services through a single autonomic proxy, comprising:

receiving a client request to locate a Web service at the single autonomic proxy;

querying a policy discovery mechanism based on the client request;

using the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group;

using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service;

sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available;

in response to a determination by the autonomic proxy that the first Web service is not available, operating the dynamic proxy to discover the business policy of each of the other service candidate in the group of Web service candidates;

in response to a determination that the first Web service is not available, operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy; and

sending a request to the second Web service to serve the client request.

2. The method of claim 1, wherein the autonomic proxy is disposed to measure the response times of each Web service by sending messages to each of the Web service candidates.

3. The method of claim 2, wherein the autonomic proxy dynamically selects the Web service that is responding most quickly according to its business policy to be the first Web service.

4. The method of claim 1, wherein the Web service is described using WSDL, and querying the policy discovery mechanism includes obtaining a WSDL Web service interface description for the requested Web service.

5. The method of claim 4, wherein querying the policy discovery mechanism includes locating a wsdlSpec tModel based on the WSDL Web service interface description for the requested Web service.

6. The method of claim 1, wherein determining which Web service candidate to invoke based on the Web service candidate business policy includes analyzing business criteria of the Web service candidate.

7. The method of claim 6, wherein the business criteria includes cost of service.

9. The method of claim 1, further comprising:

analyzing a metadata about the client request.

10. The method of claim 9, wherein the metadata includes Web service response time information.

11. The method of claim 1, wherein the locating step includes

discovering the business policy of each Web service candidate in the group of Web service candidates;

dynamically selecting the Web service from the group of Web service candidates responding the quickest based on the business policy; and

sending a request to the selected Web service to serve the client request.

12. The method of claim 1, wherein the business policy includes Web services Policy Framework (WSPolicy).

13. A data processing system for dynamically selecting functionally equivalent Web services through a single autonomic proxy, comprising:

receiving means for receiving a client request to locate a Web service at the autonomic proxy;

querying means for querying a policy discovery mechanism based on the client request;

locating means for operating the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group;

first selecting means for using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service;

first sending means for sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available;

discovering means responsive to a determination by the autonomic proxy that the first Web service is not available, for operating the dynamic proxy to discover the business policy of each of the other service candidates in the group of Web service candidates;

second selecting means, responsive to a determination that the first Web service is not available for operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy; and

sending means for sending a request to the second Web service to serve the client request.

14. The data processing system of claim 13, wherein the policy discovery mechanism is UDDI.

15. The data processing system of claim 13, wherein the Web service is described using WSDL.

16. The data processing system of claim 15, wherein the querying means includes obtaining a WSDL Web service interface description for the requested Web service.

17. The data processing system of claim 15, wherein querying means includes locating a wsdlSpec tModel based on the WSDL Web service interface description for the requested Web service.

18. The data processing system of claim 13, wherein the determining means includes analyzing business criteria of the Web service candidate.

19. The data processing system of claim 18, wherein the business criteria includes cost of service.

21. The data processing system of claim 13, further comprising:

analyzing means for analyzing a metadata about the client request.

22. The data processing system of claim 21, wherein the metadata includes Web service response time information.

23. The data processing system of claim 13, wherein the locating means includes

discovering means for discovering the business policy of each Web service candidate in the group of Web service candidates;

selecting means for dynamically selecting the Web service from the group of Web service candidates responding the quickest based on the business policy; and

sending means for sending a request to the selected Web service to serve the client request.

24. The data processing system of claim 11, wherein the business policy includes Web services Policy Framework (WSPolicy).

25. A computer program product in an executable computer readable medium for dynamically selecting functionally equivalent Web services through a single autonomic proxy, comprising:

first instructions for receiving a client request to locate a Web service at the autonomic proxy;

second instructions for querying a policy discovery mechanism based on the client request;

third instructions for operating the autonomic proxy to locate multiple Web services candidates to serve the client request, wherein each Web service candidate is functionally equivalent to the other Web service candidates, and the Web service candidates collectively comprise a group;

fourth instructions for using the single autonomic proxy to select a first Web service to invoke from the group of Web service candidates, wherein the selection is based on the business policy of the first Web service;

fifth instructions for sending a message to the first Web service from the autonomic proxy to determine if the first Web service is available;

sixth instructions for operating the dynamic proxy to discover the business policy of each of the other service candidates in the group of Web service candidates, in response to a determination by the autonomic proxy that the first Web service is not available;

seventh instructions for operating the autonomic proxy to dynamically select a second Web service from the group of Web service candidates based on the business policy, in response to a determination that the first Web service is not available; and

eighth instructions for sending a request to the second Web service to serve the client request.

26. The computer program product of claim 25, wherein the policy discovery mechanism is UDDI.

27. The computer program product of claim 25, wherein the Web service is described using WSDL.

28. The computer program product of claim 27, wherein the querying instructions include obtaining a WSDL Web service interface description for the requested Web service.

29. The computer program product of claim 25, wherein the querying instructions include locating a wsdlSpec tModel based on the WSDL Web service interface description for the requested Web service.

30. The computer program product of claim 25, wherein the determining instructions include analyzing business criteria of the Web service candidate

31. The computer program product of claim 30, wherein the business criteria includes cost of service.

33. The computer program product of claim 25, further comprising:

fifth instructions for analyzing a metadata about the client request.

34. The computer program product of claim 33, wherein the metadata includes Web service response time information.

35. The computer program product of claim 25, wherein the locating instructions include

instructions for discovering the business policy of each Web service candidate in the group of Web service candidates;

instructions for dynamically selecting the Web service from the group of Web service candidates responding the quickest based on the business policy; and

instructions for sending a request to the selected Web service to serve the client request.

36. The computer program product of claim 25, wherein the business policy includes Web services Policy Framework (WSPolicy).

# EVIDENCE APPENDIX

This appeal brief presents no additional evidence.

# RELATED PROCEEDINGS APPENDIX

This appeal has no related proceedings.